

Hydrometrics, Inc.

2727 Airport Road • Helena, Montana 59601 • (406) 443-4150 • FAX (406) 443-4155

File: Lewis & Clark Co.
City of Helena (II) inactive
get wtr (corr) closed?

October 25, 1994

Ms. Pat Potts
Montana Department of Health and
Environmental Sciences - Solid Waste Bureau
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED

OCT 26 1994

Montana Department of Health
and Environmental Sciences
Waste Management Division

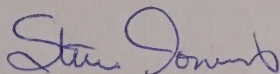
Dear Pat,

This letter is submitted on behalf of the City of Helena, to formally request a 60-day time extension for the completion of the Helena Landfill corrective measures study (CMS) for groundwater. As you are aware, the city just recently obtained landowner permission to install a new monitoring well near the northeast corner of the landfill. This well is scheduled to be installed on November 7, and it will be developed and sampled along with the rest of the monitoring wells in early November. This well will provide valuable groundwater flow and water quality information, which will be useful in completion of the CMS.

In addition, it is requested that the City be allowed to return to the Table 1 analytical parameter list for groundwater sampling. As we have previously discussed, no Table 2 parameters, that are not included on the Table 1 list have been detected in samples from the landfill area. It is likely that the Table 2 analytical parameter list provides no more useful information than does the Table 1 list.

Thank you for your continued cooperation with the City of Helena and Hydrometrics on this project. Please don't hesitate to call if you have any questions.

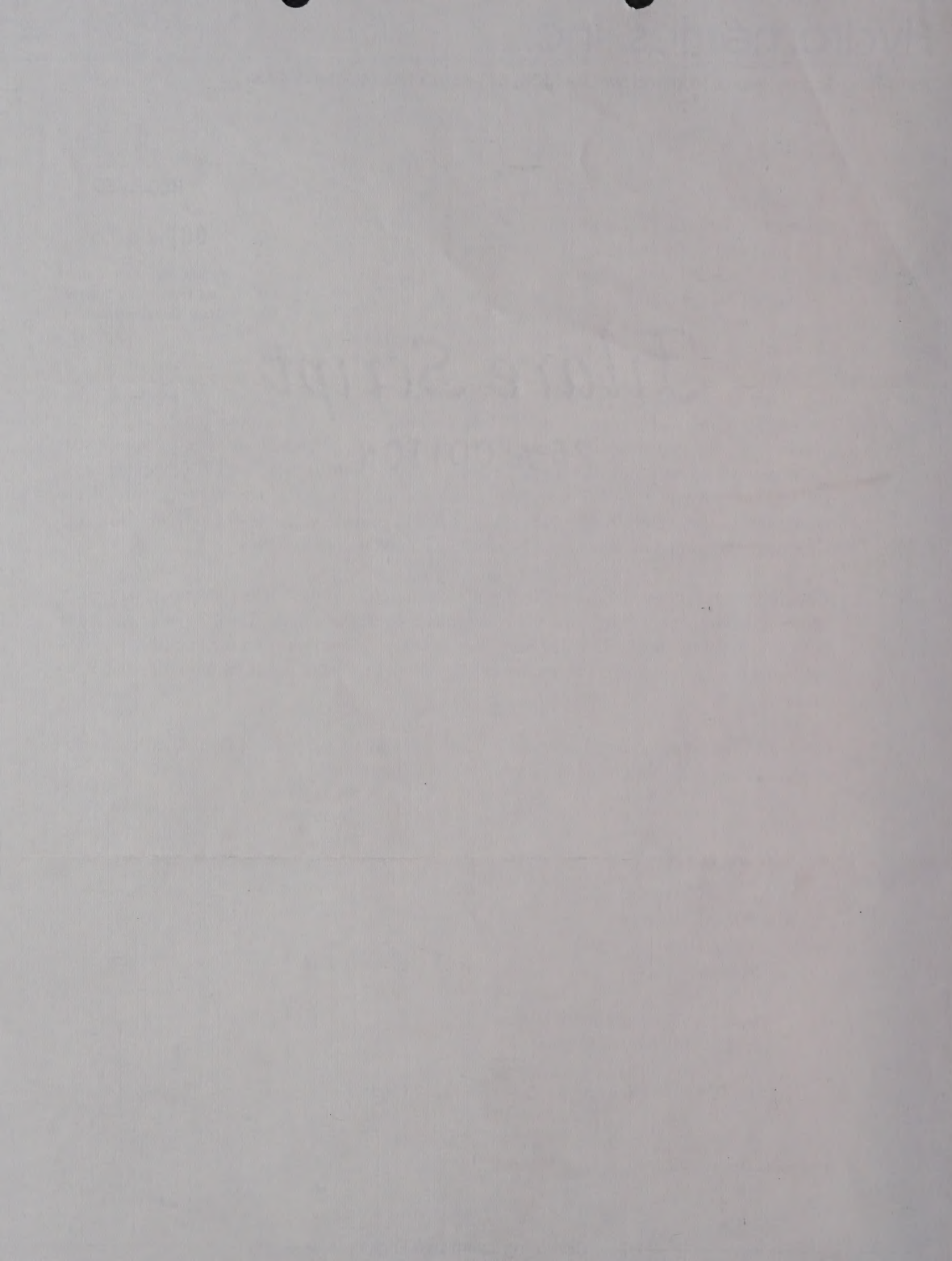
Sincerely,



Steven K. Downs, P.E.
Engineering and Environmental
Services Manager

c: Mr. Kim Millburn, City of Helena
Mr. Ted Hill, City of Helena

u:\sdowns...letters\potts5.skd



CLOSED
CITY OF HELENA LANDFILL
LICENSE NUMBER 90

HYDROMETRICS

EVALUATION OF GROUNDWATER QUALITY
DATA, APRIL 1994

JULY 1994

IS LOCATED IN THE GROUNDWATER
MONITORING REPORTS ARCHIVE,
BOX NUMBER 3

RECEIVED 7/7/1994



LEWIS AND CLARK
CITY-COUNTY HEALTH DEPARTMENT

City-County Building
316 North Park
Box 1723
Helena, Montana 59624
Telephone 406 / 447-8351

April 22, 1994

RECEIVED

APR 26 1994

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID HAZARDOUS WASTE DIVISION

Ms. Pat Potts, Environmental Specialist
Solid and Hazardous Waste Program
Dept. of Health and Environmental Sciences
P. O. Box 200901
Helena, MT 59620-0901

Re: Spring Sampling Event, City of Helena Landfill, License No. 90

Dear Pat,

Pursuant to our discussion yesterday, the following documents the Water Quality District's participation during this sampling event.

1. The following wells were sampled for Table 1 VOCs and dichlorodifluoromethane on Monday, April 18, 1994:

- #70 Gardner
- #46 Colvin
- #13 E. Johnson, on Oakwood
- #40 E. Hartman
- #51 E. Hartze (front well)
- #59 Stolp
- #75 J. Creach
- #28 Johnson, on Peosta
- #45 T. Hansen, on Oakwood
- #84 S. Spencer, 500 Cole St.

2. The following wells were sampled for Table 1 VOCs and dichlorodifluoromethane on Thursday, April 21, 1994:

- I-2 Bill Roberts Golf Course
- I-3 Bill Roberts Golf Course
- Infiltration Gallery Well - Bill Roberts Golf Course

As we discussed, Well I-5 has no sampling spigot and is probably not representative of upper aquifer groundwater due to its depth.

Well I-3 is connected by piping to another well located approximately 600 feet to the north that is not shown on Hydrometrics well location map. The two wells are not isolated from one another. The sampling point is approximately 100 feet to the west of Well I-3. Larry Kurokawa, Golf Course supervisor, has maps of their irrigation system which show the connection between the two wells.

Well I-1 is a test well and is not used for irrigation purposes. A pump is required to obtain a sample. I spoke with Steve Downs, Hydrometrics, yesterday and passed on your request that a sample be collected as soon as possible.



Ms. Pat Potts
April 22, 1994
Page 2

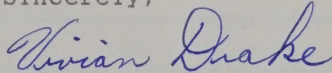
Well I-4 is used to irrigate the baseball fields in the area and has not yet been activated for the summer season. It is also in close proximity to Wells HL90-1 and I-3 and would probably contribute very little to the established database.

Mr. Kurokawa and his staff recommended that the infiltration gallery well be sampled due to its location directly downgradient from the landfill site and the fact that it is a shallow well. A sample was collected for analysis.

Mr. Kurokawa indicated that the golf course irrigation season ends in October; the sampling event for fall should probably be scheduled in early October to take advantage of well accessibility and golf course staff availability.

Please contact me if I can provide you with any additional information.

Sincerely,



Vivian Drake, Supervisor
Water Quality Protection District

cc: Mr. Ted Hill, City of Helena
Mr. Steve Downs, Hydrometrics

Person	Company	Address	Phone
Pat Potts	DHES-SW	Front Street	444-1430
Mike Wignot	Hydrometrics	2727 Airport Rd	443-4150
Steve Downs	Hydrometrics	2727 Airport Rd	443-4150
Roger Thorvilson	DHES-SHWB	Front St.	444-1430
Pat Crowley	"	"	"
Ted Hill	City of Helena	City City Rd	447-8425
Kim Milburn	City of Helena	Dir, Public Works	447-8427
Jim Wilbur	DHES/SHWB		444-1430

ORDER NO. 90

FOR SUBMITTAL OF THE

TABLE 1 LIST.

Steve Downs with Hydrometrics, concerning a request for an extension to the required submittal date for the Corrective Measures Study, and authorization to conduct the Fall 1994 ground water sampling event using the Table 1 list of parameters and constituents at the City of Helena (Inactive) Class II Landfill.

1) The Department approves the 60-day extension requested for the submittal of the Corrective Measures Study. The Study will now need to be submitted to the Department for comment and review no later than Friday, January 13, 1995.

The Department understands from speaking with you over the telephone this morning that the required notification of those people that own or reside on property above the estimated extent of the impacted ground water is underway (refer to 15.14.706(4)(a)(i)(ii)). The 60-day extension period does not cover these notifications. This notification process should be carried out promptly, and consistently.

2) Only one constituent was detected in the ground water from the required Table 2 list for the Initial Assessment Monitoring event. The Fall 1994 ground water sampling will be used to be analyzed for these parameters and constituents listed on Table 1 (APR 15.14.706(4)(a)(i)(ii)).

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Prof / MW

DATE: 11/3/94

1. Pat C.

2. Jon D. JD

3. Roger T. pc

☒ Approval

☐ Comment

☐ Necessary Action

☐ Note and Return

☐ Note and File

☐ Investigate

☐ Prepare reply

☐ Signature

☐ See Me

☐ As requested

☐ For your information

☐ Per Conversation

REMARKS:

sw/1+chel.ext

FROM: 3

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Waste Management Division

Solid Waste Program

406/444-1430

FAX # (406) 444-1499



STATE OF MONTANA

OFFICE 2209 PHOENIX AVE.
LOCATION: HELENA, MONTANA

MAILING PO BOX 200901
ADDRESS: HELENA, MT 59620-0901

November 16, 1994

Ted Hill
City of Helena
316 North Park
Helena, Montana 59623

RE: CITY OF HELENA CLASS II LANDFILL - LICENSE NO. 90

GROUND WATER MONITORING:

- 1) APPROVAL FOR A 60-DAY EXTENSION FOR SUBMITTAL OF THE CORRECTIVE MEASURES STUDY, AND
- 2) FALL 1994 SAMPLING USING THE TABLE 1 LIST.

Dear Mr. Hill:

The Department received a letter dated October 25, 1994 from Mr. Steve Downs with Hydrometrics, concerning a request for an extension to the required submittal date for the Corrective Measures Study, and authorization to conduct the Fall 1994 ground water sampling event using the Table 1 list of parameters and constituents at the City of Helena (Inactive) Class II Landfill.

1) The Department approves the 60-day extension requested for the submittal of the Corrective Measures Study. The Study will now need to be submitted to the Department for comment and review no later than Friday, January 13, 1995.

The Department understands from speaking with you over the telephone this morning that the required notification of those people that own or reside on property above the estimated extent of the impacted ground water is underway [refer to ARM 16.14.708(4)(a)(iii)]. The 60-day extension period does not cover these notifications. This notification process should be carried-out promptly, and consistently.

2) Only one constituent was detected in the ground water from the required Table 2 list for the initial Assessment Monitoring event. The Fall 1994 ground water samples will be need to be analyzed for those parameters and constituents listed on Table 1 (ARM 16.14.706), plus dichlorodifluoromethane [refer to ARM 16.14.708(1)(b)].

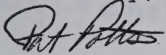
City of Helena Class II Landfill
Page 2
November 16, 1994

The Department requests that the irrigation wells at the Golf Course and the 2 Montana Power Company monitoring wells be sampled for volatile organic compounds (VOCs) to provide a characterization of the water quality representative of a Fall 1994/no irrigation period. All private irrigation wells sampled in the Spring 1994/Assessment Monitoring event will need to be sampled for VOCs, as well.

Please provide the Department with the list of the wells (monitoring, irrigation, domestic, etc.) that will be sampled and the laboratory analyses to be requested for each well, for the Fall 1994 ground water sampling event, prior to conducting the sampling.

Thank you for the correspondence requesting the above approvals. The Department hopes to work closely with the City to assist them, as needed, in providing the required information to all concerned parties in acceptable time-frames.

Sincerely,



Pat Potts
Environmental Specialist

cc: Steve Downs, Hydrometrics, Inc., 2727 Airport Road, Helena, MT 59601

Kim Milburn, City of Helena, 316 North Park Avenue, Helena, MT 59623

Bill Verwolf, City of Helena Manager, 316 N. Park Ave., Helena, MT 59623

Vivian Drake, City-County Building, 316 North Park Ave., P.O. Box 1723, Helena, MT 59624

path: sw\l&chel.ext

file: Lewis and Clark Co./City of Helena Class II (inactive)/grd
wtr (corr)

S + CL

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO:

DATE:

1. Pat C / Dayna DOS (see Page 2)
2. Jon D. JD
3. Roger fel

- | | | |
|--|---|---|
| ☒ Approval | ☐ Comment | ☐ Necessary Action |
| ☐ Note and Return | ☐ Note and File | ☐ Investigate |
| ☐ Prepare reply | ☐ Signature | ☐ See Me |
| ☐ As requested | ☐ For your information | ☐ Per Conversation |

REMARKS:

sw/ L + chelen. asm

FROM:

03

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Waste Management Division
Solid Waste Program
406/444-1430

FAX # (406) 444-1499



STATE OF MONTANA

OFFICE 2209 PHOENIX AVE.
LOCATION: HELENA, MONTANA

MAILING PO BOX 200901
ADDRESS: HELENA, MT 59620-0901

July 28, 1994

Ted Hill
City of Helena
316 North Park
Helena, Montana 59623

RE: CITY OF HELENA CLASS II LANDFILL - LICENSE NO. 90
GROUND WATER - REVIEW OF ASSESSMENT MONITORING RESULTS, AS
DISCUSSED IN THE JULY 19, 1994 MEETING

Dear Mr. Hill:

Our meeting on July 19, 1994 proved to be quite helpful. The Department also appreciates the meeting summary correspondence from Hydrometrics dated July 21, 1994. These informational exchanges all aid in maintaining the needed continuance in Assessment Monitoring to expediently initiate the assessment of Corrective Measures required according to the Administrative Rules of Montana (ARM) 16.14.708(4). Ground water items discussed in the meeting (in the order on the meeting agenda) can be summarized as follows:

#2. No additional parameters/constituents were detected from the Table 2 analysis. Although Picloram and Dicamba (herbicides) were detected by the laboratory, they are not constituents that are present on the either the Table 1 or Table 2 list of required parameters/constituents.

In the future (i.e., prior to the next required annual Table 2 analysis) it is the responsibility of the owner/operator to submit a written request to the Department demonstrating that certain constituents on the Table 2 list are not reasonably expected to be in or derived from the waste contained in the unit [see ARM 16.14.708(1)(b)].

In the case of the City of Helena, the issue of dropping certain constituents from the Table 2 list may better be addressed by selecting one or two wells (hydraulically down gradient) to run Table 2 on once per year. This suggestion is

made because with only one non-detect Table 2 event, it is difficult to be absolutely certain that the presence of some of these constituents may not be seasonally controlled.

At this point in time, it is interesting to note that the other solid waste landfill facilities in the State that have conducted a Table 2 Assessment Monitoring event have not yet found appreciable concentrations of constituents from the Table 2 list. Only those constituents that are already being sampled under the Table 1/Detection Monitoring list are consistently being detected at landfills presently monitoring the quality of the ground water.

#3. Due to the more diverse direction of flow interpreted at the north-northeast corner of the landfill boundary and the relatively elevated concentrations of tetrachloroethene detected at monitoring well EPA-1, it is important that the lateral extent of the plume in this particular area be more adequately determined as contaminant migration from this area would be off-site and off of the property owned/operated by the City for the landfill. If an appropriate location for a monitoring well can be found on Sharbono's property and access is permitted by the owner, this area should provide an adequate location to determine if the natural quality of the ground water has been impacted by the landfill along this flow path. If this is not acceptable, please notify the Department as soon as possible so that an alternative location can be selected.

#4. Although the City has been notifying those residents known to have constituent concentration levels equal to, or in excess of established U.S. EPA maximum contaminant levels (MCLs), ARM 16.14.708(4)(a)(iii) requires the owner/operator to notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site as indicated by sampling of wells.

The Department realizes the enormity of this requirement in the case of the City of Helena Landfill, but the Department strongly supports this all encompassing notification initially, as a means of full disclosure of the problem by the City. The notification should be issued when the best determination of the nature and extent of the plume has been established. This notification will need to be done prior to the submittal to the Department of the report [see ARM 16.14.708(6)(a)] on the assessment of Corrective Measures, and prior to the public meeting required in ARM 16.14.708(6)(d). The Department suggests that an iso-concentration map be generated using the most recent analytical results for dichlorodifluoromethane as a basis for determining the persons/residents to be notified; as

dichlorodifluoromethane offers the more extreme case for lateral and horizontal contaminant plume extent. The Department requests the opportunity to review this map and the notice prior to release.

#5. The assessment of Corrective Measures will be required to be submitted in written form to the Department no later than mid-November 1994 [see ARM 16.14.708(6)(a), and ARM 16.14.716(1)].

#5(a) It may be applicable to include methane gas extraction (either passive or active) with the other Corrective Measures listed on the July 19, 1994 meeting agenda once a plan of extraction is implemented at the closed landfill.

#5(b) Ground water protection standards (GWPSs) [as defined in ARM 16.14.708(5)] are intended to represent clean-up levels for those compounds that have been detected in Assessment Monitoring. Alternate ground water protection standards (AGWPSs) may be established for those compounds that have no established MCL, according to appropriate health-based level criteria, as well as considering site-specific exposure factors which may include human exposure from other pathways at the facility, population sensitivities, potential impacts on environmental receptors, and cross media contacts. Remedy factors, including cost are not to be considered in the determination of AGWPS.

However, in the assessment of Corrective Measures, it is appropriate to consider the costs of a remedy(ies), the practical applicability, as well as the technical and economic capabilities of such remedies under assessment [see ARM 16.14.708(6)(c)].

Following the selection and implementation of a remedy, if the owner/operator determines that the selected remedy cannot achieve the GWPSs (i.e., due to technical unfeasibility), the owner/operator may study alternative remedies and receive a certification that no current technology can achieve the GWPS(s) [see ARM 16.14.708(8)(b) and (8)(c)].

#5(c) Corrective Measures goals consist of compliance with the GWPSs and AGWPSs for the constituents on Table 2, for 3 consecutive years [see ARM 16.14.708(8)(e)(ii)], unless the Department specifies an alternative length of time needed to demonstrate compliance, based on the following site-specific factors:

City of Helena Class II Landfill
Page 4
July 28, 1994

- (A) Extent and concentration of the release(s),
- (B) Nature and characteristics of the constituents of concern impacting the natural quality of the ground water,
- (C) Variabilities affecting the accuracy of monitoring or modeling techniques, and
- (D) Characteristics of the ground water.

ADDITIONAL REQUIREMENTS:

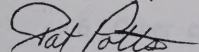
The May/June 1994 sampling event required the City to do some additional sampling for volatile organic compounds (VOCs) in irrigation wells in Bill Roberts Golf Course prior to irrigation of the golf course for the summer.

The Department is concerned that historically the monitoring wells have been sampled in the spring and the fall. We have not been able to observe the affects that extensive irrigation at the golf course, and residential lawn and garden watering may have on the quality of the ground water, as well as the direction of ground water flow and the ground water gradient (i.e., the nature and extent of the plume).

Therefore, the Department will require the City of Helena to sample the following wells for the Table 1 list of VOCs in approximately mid-August 1994 to determine if pumpage of irrigation wells has affected the nature and extent of the plume: EPA-1, MPC-1, MPC-2, HL90-1, HL90-2, HL90-3, the infiltration gallery, I-1, I-2, I-3, domestic well #84, irrigation wells #13 and #45 on Oakwood Lane, and #40 on Teakwood Lane. Any, or all of the background wells may be sampled at your discretion.

If you have any questions or comments, please give me a call.

Sincerely,



Pat Potts

Environmental Specialist

cc: Steve Downs, Hydrometrics, Inc., 2727 Airport Road, Helena, MT 59601
Kim Milburn, City of Helena, 316 North Park Avenue, Helena, MT 59623
Lewis and Clark County Commissioners, 316 North Park Ave., Helena, MT 59623
Vivian Drake, City-County Building, 316 North Park Ave., P.O. Box 1723,
Helena, MT 59624

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file: Lewis & Clark Co./City of Helena/grd wtr(corr)

CITY OF HELENA LANDFILL - MEETING - 07/19/94

AGENDA

File Copy --
Lewis + Clark Co.
City of Helena (II)
gdr wtr

- ✓ 1. Discuss placement of methane probes on north edge of landfill.
Access problems with MRL.

- yes 2. Discuss water quality for recent Table 2 monitoring.
Can we scale back parameter list?

Picloram (FS)
PQL for Dicamba

- ✓ 3. Discuss installation of new monitoring well as required by regulations.
Northeast edge of landfill - Sharbono area?

4. Discuss public notification requirements.

Should be doing this according to Fed.
= MCLs & above, 10 detected constituents.

5. Discuss assessment of corrective measures as required by regulations.

Oct/Nov

- a) Begin assessment within 90 days - finish within 60 additional days.

Include corrective measures already implemented:

Landfill Closure

Clay Cap

Stormdrain Extension

methane extraction / massive water

- b) Groundwater Protection Standards - need to be established prior to finalizing corrective measures assessment.

Tetrachloroethene - 5ppb (MCL) - but downgradient concentrations in some areas may be higher due to other sources.

Other constituents - background or levels established by toxicological assessment and approved by MDHES.

- c) Corrective measures goals - water quality better than groundwater protection standards within plume area beyond the monitoring well network (ie. relative point of compliance).

Sample for 3 yrs to be "clean".

- ✓ 6. Other closure issues:

- ✓ a) Clay cover thickness, permeability - is documentation adequate?
✓ b) Landscaping - is tree planting now in compliance?
✓ c) Revegetation this fall.

Legal
Molly W
of Peosta

Seasonality
Sample
VOCs
now

Risk
Economics
Technology

usage: irrigation

R+C.

"AGWPS - WQB-7"

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Waste Management Division
Solid Waste Program
406/444-1430

FAX # (406) 444-1499



STATE OF MONTANA

OFFICE 2209 PHOENIX AVE.
LOCATION: HELENA, MONTANA

MAILING PO BOX 200901
ADDRESS: HELENA, MT 59620-0901

July 18, 1994

Kim Milburn
City of Helena
316 North Park Avenue
Helena, Montana 59623

RE: CITY OF HELENA CLASS II LANDFILL, LEWIS AND CLARK COUNTY -
LICENSE NO. 90
GROUND WATER - CORRECTIVE MEASURES

Dear Mr. Milburn:

A facility facing ground water corrective measures activities should carefully evaluate the quality and quantity of the hydrogeologic information; and specifically, the ground water (hydrologic) data that has been accumulated to date at the site, to determine:

1. If the entire active and inactive licensed disposal areas have been adequately investigated and a sufficient number of borings and monitoring wells have been installed at the site;
2. If pre-existing data sources in the area have been investigated and evaluated, such as aerial photos, geophysical surveys, stratigraphic boreholes, piezometers, head measurements, in-situ hydraulic conductivity tests, and/or laboratory analyses of ground water samples or surface water samples collected in the area;
3. If the data from the site is consistent, or are there trend(s) or gaps in the data;
 - a. Is the hydrogeology similar across the site? More complex sites require more borings, wells, etc.
 - b. Are the ground water analytical results repeatable and consistent over time (at least 2 to 4 years)?
 - c. Have sufficient samples been taken to provide a statistical basis for comparison?

Corrective Measures

Page 2

July 18, 1994

4. Whether the contamination found in the ground water is confined to a hot spot or margin beneath the facility property, and/or beneath an adjacent property;

5. If the contamination in the ground water has migrated off-site;

6. What are the parameters/constituents of concern (i.e., driver constituents). How high are the concentrations of these constituents in the ground water? Have maximum contaminant levels (MCLs) been established for these constituents? Are they carcinogens, or toxins?

7. Is the aquifer presently being monitored a drinking water source, locally or regionally? If so, where are the receptors located in relation to the landfill site? If not, how close is the ground water-bearing zone(s) or aquifer(s) presently being monitored at the facility to a drinking water aquifer or supply source, geologically (i.e., separation in depth from ground surface to aquifer, vertically downward).

From the above information:

What are the risks to human health and the environment?

Could an alternate ground water protection standard be determined that is protective of human health and the environment?

What methods of remediation can reduce the known contaminant concentrations in the ground water sufficiently to meet the established ground water protection standards and/or background concentrations, and what are the economics associated with the proposed remedial measures?

If a potential hazard to the public is proven to be negligible, a costly program of remediation may be demonstrated to be unnecessary in some cases. If there is a potential that the public health could be significantly endangered at a site, a risk assessment (RA) must be employed to determine the appropriate levels of clean-up required to bring the risks within acceptable levels. Hazardous substance health risks can be categorized into two primary concerns:

Corrective Measures

Page 3

July 18, 1994

- a. The inherent toxicity of the contaminant, and
- b. The degree of exposure experienced by the public.

Has this facility already initiated the required upgrades to the operational procedures which may also address in-part the corrective measures remedies? Some of the operational requirements that have already been observed to help improve the quality of the ground water at an impacted landfill site are:

- I. The installation of a low permeability cover/cap over the inactive/closed disposal areas to reduce/eliminate infiltration of surface water/precipitation into the waste;
- II. Establish a vegetative layer over the cover/cap to help eliminate runoff, and reduce infiltration; and
- III. Install a passive and/or active gas venting system, as determined from methane monitoring results at the facility.

If your facility has implemented some or all of these upgrades, have you seen reduced concentrations of contaminants in the ground water? At what rate, since the above actions/measures were implemented?

The Department requires an adequate and accurate site characterization of the soils and hydrogeology be provided at each site; however, some facilities may be in a situation where natural geologic and hydrologic complexities compound the ground water contamination problem already known to exist at the site. Source removal, and/or reduction, is generally not a feasible solution. Stabilization or containment may abate problems posed by contaminant migration in the ground water. Most sites with ground water contamination must look at long-term operations and objectives, with present and potential risks to human health and the environment factored into any proposed remediation effort. It is important to understand the conditions of the ground water at the facility, the associated risks to human health and the environment, and the economically and technologically feasible approaches available under the known/existing conditions at the site.

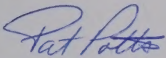
The enclosed summary of the corrective measures portion of the ARM 16.14.708 regulation will hopefully be more user-friendly than the regulations themselves. Note that this summary is organized in a more orderly, successive series of events. Regulatory citations are provided for your reference.

Corrective Measures

Page 4

July 18, 1994

Sincerely,



Pat Potts

Environmental Specialist

cc: Ted Hill, City of Helena, 316 North Park Avenue, Helena, MT
59623

Vivian Drake, City-County Building, 316 North Park, P.O. Box
1723, Helena, MT 59624

Steve Downs, Geological Engineer, Hydrometrics, Inc., 2727
Airport Road, Helena, MT 59601

ASSESSMENT MONITORING RESULTS

After a solid waste facility has initiated the Assessment Ground Water Monitoring Phase [initial sampling according to Table 2 (ARM 16.14.706)], due to parameter/constituent exceedences equal to or above an enforcement standard/ground water protection standard (MCLs), or when concentrations which are shown to be statistically significant over background (within the required 90-day period following this exceedence discovery), one of the following circumstances will become apparent from the site-specific analytical results of the Table 2 sampling:

708(2) Concentrations of all Table 2* constituents are at or statistically below background values for 2 consecutive sampling events;

708(3) Concentrations of any Table 2* constituents are statistically above background values, but all concentrations are below the ground water protection standards (MCLs)/enforcement standards; or

708(4) Concentrations of one or more Table 2* constituents are detected at statistically significant levels above the ground water protection standards (MCLs)/enforcement standards.

If 708(2), then the facility may return to Detection Monitoring (i.e., sampling for Table 1 [ARM 16.14.706]).

If 708(3), then the facility will remain/continue in Assessment Monitoring.

* Refers to both Table 1 and Table 2 (ARM 16.14.706) parameters/constituents, as Table 2 is inclusive of most parameters/constituents on Table 1.

CORRECTIVE MEASURES ASSESSMENT (CMA)

However, if 708(4) is true and an exceedence has occurred, then the facility is required to:

- 16.14.708(4)(a)(i) Install additional monitoring wells, as needed, to characterize the nature and extent of the release,
- 708(4)(a)(ii) Install at least 1 additional monitoring well at the hydraulically down gradient facility property boundary,
- 708(4)(a)(iii) Notify all persons who own the land or reside on the land that directly overlies the plume, and
- 708(4)(a)(iv) Initiate an "assessment of corrective measures", within 90 days from the discovery/receipt of the analytical results from the Table 2 ground water analysis (i.e., the initial Assessment Monitoring event). The assessment is to be completed within an additional 60 days (i.e., 150 days total time allowed for assessment of corrective measures, from the date of the receipt of the analytical results from the initial Table 2 sampling event) for submittal to the Department [ARM 16.14.708(6)(a)].

The Corrective Measures Assessment (CMA) is Required to Include the Following:

- 16.14.708(6)(c) Analysis of the effectiveness of potential corrective measures,
(Requirements and objectives of each remedy under consideration.)

Corrective Measures

Page 7

July 18, 1994

- 708(6)(c)(i) For each remedy proposed, evaluate the following:
- Performance
 - Reliability
 - Ease of implementation
 - Potential impacts - safety,
cross-media,
control exposure to any residual
contamination.
- 708(6)(c)(ii) Time-frames - initiate remedy (i.e., operational)
estimated completion of remedy
- 708(6)(c)(iii) Costs - based on site-specific contaminants, concentrations, and
media volumes.
- 708(6)(c)(iv) Additional requirements - State and/or local permit
requirements, or other environmental
or public health requirements that
may affect implementation of each
remedy suggested.
- A report will be required by the Department addressing all of the above issues for each
remedy considered [ARM 16.14.716(1)].
- 708(6)(d) The results arrived at from the CMA are required to be discussed in a
PUBLIC MEETING with interested and affected parties prior to final
remedy selection.

NOTICE OF

REPLY OF THE BOARD OF DIRECTORS TO THE PETITION FOR THE RECALL OF THE BOARD OF DIRECTORS

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CORRECTIVE MEASURES REMEDY SELECTION

From the results of the corrective measures assessment (CMA) and the accompanying report submittal to the Department, the owner/operator is required to select a remedy based on the results of the CMA, and to notify the Department within at least 14 days from the date of the selection. This remedy must meet the following standards [ARM 16.14.708(7)(a)]:

- 708(7)(b)(i) Protective of human health and the environment,
- 708(7)(b)(ii) Attain the ground water protection standard, or the alternate ground water protection standard,
- 708(7)(b)(iii) Control source(s) - reduce or eliminate releases,
- 708(7)(b)(iv) Comply with the "Standards for Management of Wastes", which requires a schedule for "Initiating and Completing Remedial Activities". The schedule should consider the following factors:
 - 708(7)(d) Schedule - "Initiating and completing remedial activities" should consider the following factors:
 - 708(7)(d)(i) Extent and nature of contamination,
 - 708(7)(d)(ii) Practical capabilities of remedial technologies in achieving compliance with ground water protection standards,
 - 708(7)(d)(iii) Treatment or disposal capacity for wastes,
 - 708(7)(d)(iv) Utilization of unavailable technologies (i.e., future technologies), and

- 708(7)(d)(v) Risks to human health and the environment:
- 708(7)(d)(vi) Resource value of the aquifer,
- 708(7)(d)(vi)(A) Current and future uses,
- 708(7)(d)(vi)(B) Proximity and withdrawal rate of users,
- 708(7)(d)(vi)(C) Ground water quantity and quality,
- 708(7)(d)(vi)(D) Potential damage due to exposure to wildlife, crops, vegetation, and physical structures,
- 708(7)(d)(vi)(E) Hydrogeologic characteristic of the facility and the surrounding land,
- 708(7)(d)(vi)(F) Ground water removal and treatment costs, and
- 708(7)(d)(vi)(G) Cost and availability of alternate water supplies.
- 708(7)(d)(vii) Practical capability of the owner/operator.
- 708(7)(d)(viii) Other relevant factors.
- 708(8)(a) The schedule for "Initiating and Completing Remedial Activities" requires the owner/operator to provide:
- 708(8)(a)(i) Corrective action ground water monitoring program:
- 708(8)(a)(i)(A) At least as inclusive as the Assessment Monitoring program,
- 708(8)(a)(i)(B) Demonstrates the effectiveness of the corrective action remedy, and

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- 708(8) (a) (i) (C) Demonstrates compliance with the ground water protection standards.
- 708(8) (a) (ii) Implementation of corrective action remedy selected.
- 708(8) (a) (iii) Possible interim measures to ensure the protection of human health and the environment.
- 708(8) (b) Evaluation of compliance achieved (or not achieved) through the remedy selected. If not, owner/operator is required to select another remedy or technique, OR
- 708(8) (c) Determine that compliance cannot be practically achieved with any currently available methods by:
- 708(8) (c) (i) Obtain certification from a qualified ground water scientist and approval by the Department that compliance cannot be achieved,
- 708(8) (c) (ii) Implement alternative measures to control exposure, and protect human health and the environment,
- 708(8) (c) (iii) Implement alternative measures for the control of sources of contamination, etc. as is:
- 708(8) (c) (iii) (A) Technically practicable,
- 708(8) (c) (iii) (B) Consistent with remedial objective(s), and

Corrective Measures

Page 11

July 18, 1994

- 708(8)(c)(iv) Submit a report to the Department 14 days prior to the implementation of the alternative measures. This report should include an evaluation of all remedies considered, as well as the NO ACTION alternative [ARM 16.14.716(1)] if this information has not been thoroughly addressed in the CMA report.
- 708(7)(b)(v) Approved by the Department.
- 708(7)(c) Remedy(ies) "evaluation factors":
- 708(7)(c)(i) Effectiveness and protectiveness (short- and long-term), as well as the degree of certainty that the remedy(ies) will be successful considering:
- 708(7)(c)(i)(A) Magnitude of reduction of existing risk,
- 708(7)(c)(i)(B) Magnitude of residual risks,
- 708(7)(c)(i)(C) Long-term management required (monitoring, operation, and maintenance,
- 708(7)(c)(i)(D) Short-term risks (community, workers, or the environment),
- 708(7)(c)(i)(E) Time until full protection achieved,
- 708(7)(c)(i)(F) Potential for exposure (human and environmental),
- 708(7)(c)(i)(G) Long-term reliability, and
- 708(7)(c)(i)(H) Potential need for replacement of the remedy.

108 (A) (C) (7) (H)

documentary evidence of the same.

108 (A) (C) (7) (C)

and "Attorney General"

108 (A) (C) (7) (A)

documentary evidence of the same.

108 (A) (C) (7) (B)

documentary evidence of the same.

108 (A) (C) (7) (D)

documentary evidence of the same.

108 (A) (C) (7) (E)

documentary evidence of the same.

108 (A) (C) (7) (F)

documentary evidence of the same.

108 (A) (C) (7) (G)

documentary evidence of the same.

108 (A) (C) (7) (H)

documentary evidence of the same.

108 (A) (C) (7) (I)

documentary evidence of the same.

108 (A) (C) (7) (J)

documentary evidence of the same.

108 (A) (C) (7) (K)

documentary evidence of the same.

- 708 (7) (c) (ii) Effectiveness of the remedy in controlling the source based on the following factors:
- 708 (7) (c) (ii) (A) Containment practices usage, and
- 708 (7) (c) (ii) (B) Treatment technology use.
- 708 (7) (c) (iii) Implementation of a potential remedy(ies) - ease or difficulty.
- 708 (7) (c) (iii) (A) Construction technology,
- 708 (7) (c) (iii) (B) Operational reliability,
- 708 (7) (c) (iii) (C) Approvals and permits from other agencies,
- 708 (7) (c) (iii) (D) Availability of equipment and specialists, and
- 708 (7) (c) (iii) (E) Available capacity and location of needed treatment.
- 708 (7) (c) (iv) Technical and economic capability of the owner/operator.
- 708 (7) (c) (v) Address community concerns with relation to potential remedy(ies).
- 708 (7) (e) The Department may determine that remediation of a release is not necessary if the owner/operator demonstrates that:
- 708 (7) (e) (i) There is additional contamination of the ground water from a source other than the landfill, and clean-up of the landfill associated contamination would not reduce risks to actual or potential receptors, OR

Corrective Measures

Page 13

July 18, 1994

- 708(7)(e)(ii) The ground water is:
- 708(7)(e)(ii)(A) Not currently or reasonably expected to be a source of drinking water, and
- 708(7)(e)(ii)(B) Not hydraulically connected, or will not migrate in concentrations exceeding the ground water protection standards, OR
- 708(7)(e)(iii) Remediation is technically impractical, OR
- 708(7)(e)(iv) Remediation results in unacceptable cross-media impacts.
- 708(7)(f) The State will still maintain the authority to require the owner/operator to undertake source control measures or other measures to eliminate or minimize further releases to the ground water, to prevent exposure to the ground water, or to remediate the ground water to concentrations that are technically practical and significantly reduce threats to human health and the environment.

The following information was obtained from the records of the
 Department of the Interior, Bureau of Land Management, at
 Washington, D. C., on the 15th day of May, 1934.
 The records of the Bureau of Land Management show that the
 following lands are owned by the United States Government:
 1. A certain tract of land, situated in the County of
 Adams, State of Colorado, containing approximately 100
 acres, more or less, and being more particularly described
 as follows:

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100 (1) (1) 100

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: *Roof CU* *Pat C* *per* DATE: *4/7/94*

- Jon D JD*
- Roger T per*

- | | | |
|--|---|---|
| ☒ Approval | ☐ Comment | ☐ Necessary Action |
| ☐ Note and Return | ☐ Note and File | ☐ Investigate |
| ☐ Prepare reply | ☐ Signature | ☐ See Me |
| ☐ As requested | ☐ For your information | ☐ Per Conversation |

REMARKS:

sw/1+chel.sap

*mailed
4-8-94*

*Route quickly please
Fax: to Hydrometrics
upon route completion
+ call Ted Hill 447-8456
(not back until Mon.)*

FROM: *p3*

MENT OF
NMENTAL SCIENCES
ous Waste Bureau
e Program
4-1430

FAX # (406) 444-1499

10NTANA

MAILING PO BOX 200901
ADDRESS: Helena, MT 59620-0901

, LEWIS AND CLARK COUNTY -

SAMPLING AND ANALYSIS PLAN FOR
ND WATER MONITORING ACTIVITIES",

WATER MONITORING AND SAMPLING EVENT.

Dear Mr. Hill:

The above-referenced "Sampling and Analysis Plan (SAP) for the City of Helena (Class II) Landfill Ground Water Monitoring Activities" submitted to the Department yesterday, has been **approved for implementation**. It is important to point out that the interpretation of the Administrative Rules of Montana (ARM) on page 5, paragraph 2 of section 1.3.2 "Parameters Monitored" of the SAP, which concerns continued Assessment Monitoring is not fully explained and may alter the intent of long-term applicability. This paragraph should be rewritten to incorporate some of the following additional information:

Table 2 constituents detected from the Spring 1994 Assessment Monitoring event, not present on Table 1, will require a total of 4 independent samples be collected from each well (down gradient and upgradient) to establish background for those additionally detected constituents [initially ARM 16.14.709(1)(a)(iv), or continued ARM 16.14.708(1)(a)(v)(B)].

Please note:

ARM 16.14.708(4) In the particular case of the City of Helena Landfill, constituent concentrations initiating Assessment Monitoring exceeded established enforcement standards/Ground Water Protection Standards (GWPS)/maximum contaminant levels

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
400/444-1439

DATE (MM/DD/YYYY)

STATE OF MONTANA

TO: [Name]
FROM: [Name]
SUBJECT: [Subject]

DATE: [Date]
TIME: [Time]
LOCATION: [Location]



April 7, 1994

Mr. Bill
City of Helena
316 North Park
Helena, Montana 59601

RE: CITY OF HELENA CLASS II LANDFILL, LEWIS AND CLARK COUNTY -

LICENSE NO. 90

- 1) REVIEW AND APPROVAL OF THE SAMPLING AND ANALYSIS PLAN FOR THE CITY OF HELENA LANDFILL GROUND WATER MONITORING ACTIVITIES, MARCH 1994, AND
- 2) ATTACHMENT CONTAINING SPECIFIC NEEDS FROM SPRING 1994 GROUND WATER MONITORING AND SAMPLING EVENT.

Dear Mr. Bill:

The above-referenced "Sampling and Analysis Plan (SAP)" for the City of Helena (Class II) Landfill Ground Water Monitoring Activities, submitted to the Department yesterday, has been approved for implementation. It is important to point out that the interpretation of the Administrative Rules of Montana (ARM) on page 1, paragraph 1 of section 1.2.2, "Assessment" of the SAP, which concerns continued Assessment Monitoring is not fully explained and may alter the intent of long-term applicability. This paragraph should be revised to incorporate some of the following additional information:

Table 2 constituents derived from the Spring 1994 Assessment Monitoring event, are present on Table 1, will require a total of 4 independent samples be collected from each well (down gradient and upgradient) to establish background for those additionally detected constituents (initially ARM 16.14.708(1)(a)(i) or continued ARM 16.14.708(1)(a)(v)(B)).

ARM 16.14.708(4) in the particular case of the City of Helena Landfill, constituent concentrations exceeding Assessment Monitoring established enforcement standards should be reported to the Department (GWPS) immediately.

April 7, 1994

(MCL)s. These constituent concentrations detected above MCLs in the ground water will most likely be analyzed at concentrations statistically significant above MCLs in the Spring 1994 sampling event. If this should be true, according to ARM 16.14.708(4), a series of 4 actions [i.e., ARM 16.14.708(4)(i) through (iv)] will be required to be initiated, with action (iv) being the initiation of Corrective Measures. Unless, the City feels that the independent replicate sample data is necessary for verification of analytical data, study for Corrective Measures, or other immediate applications, the Department will allow the additional analytical information on singularly detected Table 2 constituents to be collected and analyzed over the normal semi-annual sampling schedule.

However, if:

ARM 16.14.708(3) Constituent concentrations decrease below enforcement standards/GWPSs/MCLs, but are still above background levels, the facility will continue in Assessment Monitoring, OR

ARM 16.14.708(2) Concentrations of all constituents required to be sampled in the ground water decrease to background levels or below, for 2 consecutive semi-annual sampling events (i.e., 2 years) after notifying the Department, the facility may return to Detection Monitoring.

ARM 16.14.708(2) is the situation referred to in paragraph 2 of section 1.3.2 of the SAP.

Bear in mind, that all parameter/constituents listed in Table 1 [except chloride, sulfate, nitrate, iron, chemical oxygen demand (COD), pH, and specific conductivity] are also included in Table 2. Therefore, an exceedence in Table 1 (i.e., equal to, or above MCLs) will most assuredly be present in the ground water analysis when the sampling event for Table 2 is conducted this year (Spring 1994). This implication is not taking into account the possible positive effects that the closure of the landfill could have on improving the quality of the ground water in this area (such as closure with a low permeability cover material, methane monitoring and/or extraction) which could reduce some constituent concentrations in the ground water at this facility over time.

Please review the **Attachment** to this letter which most specifically addresses the Spring 1994 ground water sampling requirements. You may wish to revise Table 1 on page 6 of the SAP to reflect a more inclusive list of domestic/irrigation wells that should be considered for sampling.

(MCLs). These constituent concentrations detected above MCLs in the ground water will need likely be analyzed at concentrations statistically significant above MCLs in the Spring 1994 sampling event. If this should be true, according to ARM 16.14.708(4), a series of 4 actions (i.e., ARM 16.14.708(4)(i) through (iv)) will be required to be initiated, with action (iv) being the initiation of Corrective Measures. Unless the City feels that the independent replicate sample data is necessary for verification of analytical data, study for Corrective Measures, or other immediate applications, the Department will allow the additional analytical information on singularly detected Table 2 constituents to be collected and analyzed over the normal semi-annual sampling schedule.

However, if
ARM 16.14.708(3) Constituent concentrations detected below background
standards (WTS/MCLs) but are still above background levels, the facility will
continue its Assessment Monitoring OR

ARM 16.14.708(3) Concentrations of all constituents required to be sampled in the
ground water decrease to background levels or below, for 3 consecutive semi-annual
sampling events (i.e., 3 years) after notifying the Department the facility may
return to Disposal Monitoring.

ARM 16.14.708(3) is the situation referred to in paragraph 1 of section 1.3.2 of the
SAR.

It is noted that all parameters/constituents listed in Table 1 (except chloride, nitrate,
nitrite, iron, chemical oxygen demand (COD), pH, and specific conductivity) are also
included in Table 2. Therefore, an occurrence in Table 1 (i.e., equal to or above MCLs)
will most assuredly be present in the ground water analysis when the sampling event for
Table 2 is conducted the year (Spring 1994). This implication is not being made because
the possible positive effects and the extent of the landfill could have an improving the
quality of the ground water in this area (such as closure with a low permeability cover
material, methane monitoring and/or extraction) which could reduce some constituent
concentrations in the ground water at this facility over time.

Please review the Attachment to this letter which most specifically addresses the Spring 1994
ground water sampling requirements. You may wish to review Table 1 on page 6 of the SAR to
reflect a more inclusive list of domestic/industrial wells that should be considered for sampling.

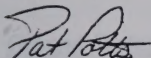
City of Helena Class II Landfill

Page 3

April 7, 1994

Please remember to add **dichlorodifluoromethane** to the list of VOC constituents on Table 1. Dichlorodifluoromethane is on the Table 2 list. If you have any questions or comments, please give me a call.

Sincerely,



Pat Potts

Environmental Specialist

Attachment - Specifics Concerning Spring 1994 Ground Water Monitoring

cc: Steve Downs, Geologic Engineer, Hydrometrics, Inc. 2727 Airport Road, Helena, MT 59601

Howard Reid, R.S., City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

Vivian Drake, City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

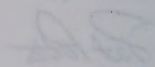
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file: lewis & clark co./city of helena (closing)/grd wtr

April 1, 1994

Please remember to add dichloromethane to the list of VOC constituents on Table 1. Dichloromethane is on the Table 2 list. If you have any questions or comments, please give me a call.

Sincerely,



Pat Pons

Environmental Specialist

Attachment - Specimen Concerning Spring 1994 Ground Water Monitoring

cc: Steve Brown, Geologic Engineer, Hydrometals Inc. 2227 Airport Road, Helena, MT 59601

Howard Reid, P.E., City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

Vivian Drake, City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

pat: w/attached
Enc. lists a date of return (closing) and we

**SPECIFICS CONCERNING THE SPRING 1994 GROUND WATER MONITORING AND
SAMPLING EVENT AT THE CITY OF HELENA CLASS II LANDFILL**

Ground Water Monitoring Wells to be sampled for Table 2

83-6
EPA-1
MPC-1
HL90-1
HL90-2
HL90-3
HL94-1
HL94-2

Domestic/Irrigation Wells to be Sampled for all Table 1

#84 (north-northeast of the infiltration gallery well)

Domestic/Irrigation Wells to be Sampled for Table 1 VOCs

As listed in the SAP:

#70 Gardner
#46 Colvin
#13 E. Johnson
#40 E. Hartman
#51 or #52 (?) E. Hartze [Is this front or rear well?]
#? Stolp
#75 J. Creach

Additional wells requested:

#28 Johnson, on Peosta
I-5
#45 on Oakwood
I-1 through I-4 (Bill Roberts Golf Course)

STUDIES CONCERNING THE SPRING 1994 GROUND WATER MONITORING AND
 SAMPLING EVENT AT THE CITY OF HELENA CLASS II LANDFILL

Ground Water Monitoring Wells to be Sampled for Table 1

HI-94-1
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 HI-94-3
 HI-94-4
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 HI-94-99
 HI-94-100

Domestic/Industrial Wells to be Sampled for all Table 1

104 (south-eastern of the industrial facility well)

Domestic/Industrial Wells to be Sampled for Table 1 YOC

As listed in the SAP:
 470 Garden
 446 Colvin
 417 E. Johnson
 410 E. Johnson
 421 or 422 (V) E. Johnson (is this from a new well?)
 472 Strip
 472 L. Green

Additional wells requested:
 422 Johnson on Power
 1-2
 442 up Oakwood
 1-1 through 1-4 (Bill Roberts Golf Course)

City of Helena Class II Landfill

Page 5

April 7, 1994

MESSAGE CONFIRMATION

Possibly the list of domestic/irrigation wells provided on page 6 of the SAP should be expanded to include more of the wells that have been sampled in the past that remain as a concern, or border on the MCL constituent concentration level or exceed it.

Water levels at all wells measured for the October 1993 Water Level Elevation Map, plus the 2 new wells should also be measured in conjunction with the Spring 1994 sampling event. A map will be required showing the direction of ground water flow.

Possibly the list of domestic/irrigation wells provided on page 6 of the CAP should be expanded to include more of the wells that have been sampled in the past that remain as a concern, or border on the MCL, consistent concentration level or exceed it.

Water levels at all wells measured for the October 1993 Water Level Elevation Map, plus the 2 new wells should also be measured in conjunction with the Spring 1994 sampling event. A map will be required showing the direction of ground water flow.

MESSAGE CONFIRMATION

SESSION NO. = 813

04/08/94 11:40

DATE	TIME	S.R-TIME	DISTANT STATION ID	MODE	PAGES	RESULT
04/08	11:38	02'26"	406 443 4155	ECM-S	05	OK 0000

Hydrometrics
Steve Downs
443-4155
FAX

Dear Mr. Hill:

The Department believes that the meeting on March 15, 1994, which covered a variety of ground water monitoring issues concerning the City of Helena Class II Landfill, was beneficial to all. The following items are intended as a brief summary of the results of the meeting:

1. A revised/current Sampling and Analysis Plan (SAP) will be submitted to the Department on March 23, 1994, for review. Assuming there are no major changes from the previously approved sampling and analysis procedures and protocols, this Plan should be approved within 2 to 3 days following the date of submittal. The Plan should be organized in such a manner that future updates can be addressed with revised insert pages. (NOTE: This SAP has ~~not~~ been received by the Department)

2. In an effort to provide an adequate and accurately documented demonstration of other possible sources of contaminants detected in the ground water at the City of Helena Class II Landfill, the City will try to secure copies of the following: a Water Quality Based map designating sources of known contamination in the area, and a "mini-Superfund" list concerning the Highway Department property at the Lewis and Clark County Fairgrounds that might be cleaned from Vernon Drive, the Lewis and Clark County Hydrogeology. If such information appears to be useful, it may be incorporated into a demonstration to be submitted to the Department to show the impact of possible alternative sources of contaminants to the ground water in the area.

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

Lewis &
Clark

TO:

Roof CU

DATE:

3/29/94

1.

Lat C - OUT

2.

Jon D JD

3.

Roger per

☒

Approval

☐

Comment

☐

Necessary Action

☐

Note and Return

☐

Note and File

☐

Investigate

☐

Prepare reply

☐

Signature

☐

See Me

☐

As requested

☐

For your information

☐

Per Conversation

REMARKS:

SW/L + chel. met

FROM:

P3

mailed
4-1-94
Dr

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Solid and Hazardous Waste Bureau

Solid Waste Program

MARC RACICOT, GOVERNOR 406/444-1430

FAX # (406) 444-1499



STATE OF MONTANA

OFFICE LOCATION 836 Front Street
Helena, Montana

MAILING ADDRESS: PO BOX 200901
Helena, MT 59620-0901

April 1, 1994

Ted Hill
City of Helena
316 North Park
Helena, Montana 59623

RE: CITY OF HELENA CLASS II LANDFILL, LEWIS AND CLARK COUNTY -
LICENSE NO. 90
GROUND WATER MONITORING MEETING ON MARCH 15, 1994 - CONCLUSIONS

Dear Mr. Hill:

The Department believes that the meeting on March 15, 1994, which covered a variety of ground water monitoring issues concerning the City of Helena Class II Landfill, was beneficial to all. The following items are intended as a brief summary of the results of the meeting:

1. A revised/current **Sampling and Analysis Plan (SAP)** will be submitted to the Department on March 28, 1994, for review. Assuming there are no major changes from the previously approved sampling and analysis procedures and protocols, this Plan should be approved within 2 to 3 days following the date of submittal. The Plan should be organized in such a manner that future updates can be addressed with revised insert pages. (NOTE: This SAP has not been received by the Department).
2. In an effort to provide an adequate and accurately documented demonstration of other possible sources of contaminants detected in the ground water at the City of Helena Class II Landfill, the City will try to access copies of the following: a Water Quality Bureau map designating sources of known contamination in the area, and a "mini-Superfund" list concerning the Highway Department property at the Lewis and Clark County Fairgrounds that might be obtained from Vivian Drake, the Lewis and Clark County Hydrogeologist. If such information appears to be useful, it may be incorporated into a demonstration to be submitted to the Department to show the impacts of possible alternative sources of contaminants to the ground water in the area.

April 1, 1994

3. To reiterate a point of rule interpretation, when an enforcement standard/established maximum contaminant level (MCL) is reached or exceeded in the ground water at a solid waste facility, Assessment Monitoring is required [see, the Administrative Rules of Montana (ARM) 16.14.708(1)(a)]. Corrective Measures are incurred when a constituent concentration is statistically significant above the established MCL for that particular constituent [see, ARM 16.14.708(4)(a)(iv)]. If there are no MCL exceedences, but constituent concentrations for which there are no established MCLs are detected to be of a statistically significant increase above background [see, ARM 16.14.708(5)(b) concerning Ground Water Protection Standards], the constituent(s) shall be subject to assessment of Corrective Measures [see, ARM 16.14.708(6)(a)]. A risk assessment may be provided demonstrating that the particular constituent(s) are not posing a risk to human health and the environment and an Alternative Ground Water Protection Standard(s) may be approved by the Department [see, ARM 16.14.708(5)(d)].

4. It was agreed that the domestic well located approximately 600 feet northwest of the infiltration gallery north of the landfill site, and labeled on the "Well Location and Potentiometric Surface Map" dated October, 1993, as **domestic well #84** should be sampled promptly for ARM 16.14.706 Table I parameters/constituents, including dichlorodifluoromethane.

5. The Department requested that the 4 irrigation wells (I-1 through I-4) be sampled at the Bill Roberts Golf Course as soon as possible to be able to collect a sample before they are put into active irrigation use for the Spring/Summer. Ground water samples collected from these 4 irrigations wells need only be analyzed for the volatile organic compounds listed in Table I, plus dichlorodifluoromethane.

6. The MCL for tetrachloroethene was equaled or exceeded in several ground water monitoring wells and one private irrigation well (EPA-1, HL90-1, MPC-1, and #40 Hartman) according to the sample results from the Fall 1993 event. The concentrations of tetrachloroethene in these wells has initiated the Assessment Monitoring Phase for this facility. This will require sampling the following 6 monitoring wells immediately adjacent to the facility for ARM 16.14.706 Table II: EPA-1, HL90-1, HL90-2, HL90-3, MPC-1 and the background well (83-6). According to ARM 16.14.708(1)(a)(ii), the owner/operator has 90 days from the date of the discovery of the constituent concentration exceedence(s) to re-sample for the long list of constituents (i.e., ARM 16.14.706 Table II). Such a discovery is determined to be upon the receipt of the laboratory analytical results by the owner/operator or their appointed consultant. In this case, April 12, 1994, would be the expiration of the 90 days.

The Department realizes that the Spring 1994 ground water sampling event is also nearing the scheduled high water period for sampling. As discussed, it would be prudent to coordinate a complete sampling effort, including all wells (monitoring and domestic) for a Spring/Assessment Monitoring event.

City of Helena Class II Landfill

Page 3

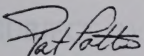
April 1, 1994

7. Drilling and installation of two additional ground water monitoring well locations was agreed upon in the meeting. The first location was designated to be southeast from EPA-1, near the alley along the north edge of Memorial Park. The second location was determined to be hydraulically upgradient from the Benton Avenue/Pioneer Cemetery. This location cannot fully be appreciated by the Department, but the Department will be agreeable to it, as the City feels it will help in providing additional background water quality information. These two ground water monitoring wells should be installed promptly. Unfortunately, installation of these wells will probably not be accomplished before the Assessment Monitoring event is required to be conducted (i.e., April 12, 1994). Therefore, sampling of these wells will undoubtedly occur as a separate event, or no later than the Fall 1994 sampling event.

8. The Department is aware that the low permeability cap placed over the licensed disposal area is one form of Corrective Action. We hope to be observing the effects of the reduced infiltration into the waste, reducing the amount of leachate being generated and migrating into the ground water, and eventually being reflected in reduced constituent concentrations in the ground water in the near future.

The Department is encouraged with the progress we have made through this meeting. We are fully expecting the City of Helena to comply with the conditions given above. If you have any questions, additional items that need to be addressed, and/or comments, please give me a call. Results from the Assessment Monitoring event will need to be submitted to the Department within 14 days from the receipt of those results from the laboratory by the City or their contracted consultants.

Sincerely,



Pat Potts

Environmental Specialist

cc: Steve Downs, Geologic Engineer, Hydrometrics, Inc., 2727 Airport Road, Helena, MT 59601

Howard Reid, R.S., City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

Vivian Drake, City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

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ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO:

Proof RH

DATE:

2/23/94

1.

Pat C

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Jon D. JD

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Roger T. pet

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| ☒ Approval | ☐ Comment | ☐ Necessary Action |
| ☐ Note and Return | ☐ Note and File | ☐ Investigate |
| ☐ Prepare reply | ☐ Signature | ☐ See Me |
| ☐ As requested | ☐ For your information | ☐ Per Conversation |

REMARKS:

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FROM:

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DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Solid and Hazardous Waste Bureau

Solid Waste Program

MARC RACICOT, GOVERNOR 406/444-1430

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STATE OF MONTANA

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MAILING PO BOX 200901
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February 25, 1994

Ted Hill
City of Helena
316 North Park
Helena, Montana 59623

RE: CITY OF HELENA CLASS II LANDFILL, LEWIS AND CLARK COUNTY -
LICENSE NO. 90

REVIEW: (1) GROUND WATER ANALYTICAL RESULTS -FALL 1993 EVENT,
(2) "1993 ANNUAL REPORT ON GROUND WATER MONITORING",
(3) "EVALUATION OF GROUND WATER,
QUALITY DATA AT THE CITY OF HELENA",
FEBRUARY, 1994, AND
(4) OTHER.

Dear Mr. Hill:

SUBJECT (1): Ground Water Analytical Results - Fall 1993 Event.

In reviewing the ground water monitoring analytical results from the Fall 1993 sampling event (conducted on December 15 and 16, 1993 and domestic wells sampled on January 4, 1994), the Department noticed that concentrations of **tetrachloroethene** in samples collected from the following wells (monitoring wells, and irrigation) equal or exceed the maximum contaminant level (MCL) for tetrachloroethene, which is 5 mg/L:

EPA-1	36 mg/L,
HL-90-1	18 mg/L,
MPC-1	17 mg/L, and
#40 Hartman	5.10 mg/L.

February 25, 1994

Ground water analytical results from monitoring well MPC-1 also revealed an MCL exceedence in nitrates, as nitrogen (N). The nitrate, as N concentration for MPC-1 was detected at 10.4 mg/L. The MCL for nitrate is 10 mg/L.

The Administrative Rules of Montana (ARM) 16.14.708(1)(a)(i) states that an owner/operator of a solid waste facility must notify the Department in writing within 14 days of the discovery of ground water concentration(s) in samples from any facility ground water monitoring wells for any ARM 16.14.706 Table 1 constituent that:

- * Equal or exceed an **enforcement standard**, or
- * Show a significant statistical increase above background levels, or
- * Show a statistically significant decrease in pH. [see ARM 16.14.708(1)(a)]

According to ARM 16.14.708(5)(a), an enforcement standard is used synonymously with a ground water protection standard (GWPS) and represents the maximum contaminant level (MCL) promulgated under the Montana ground water quality standards. For those constituents which presently do not have promulgated State MCLs, ARM 16.20.1003(5) states the following:

"concentrations of other dissolved or suspended substances must not exceed levels which render the waters harmful, detrimental or injurious to public health. Maximum allowable concentrations of these substances also must not exceed acute or chronic problem levels which would adversely affect existing beneficial uses or the designated beneficial uses of ground water of that classification. Values listed in "Quality Criteria for Water", U.S. EPA, Washington, D.C. (EPA Red Book), July, 1976/(Gold Book), 1986; Hem, John D., "Study and Interpretation of the Chemical Characteristics of Natural Water, " Second Edition, USGS Water Supply Paper 1473, USGPO, Washington, D.C., 1970; McKee, J.E., and Wolf, H.W., "Water Quality Criteria", Second Edition, California State Water Quality Control Board, Publication No. 3-A, 1963; and "Diagnosis and Improvement of Saline and Alkali Soils," Agriculture, February, 1954, shall be used as a **guide** to determine the problem levels unless local conditions make the values inappropriate."

Additionally, more current guidance commonly used in evaluating impacted water quality with regard to the human health and the environment is the list of "Drinking Water Regulations and Health Advisories," dated May 1993, from the U.S. EPA Office of Water. In the near future (March or April, 1994), revised (as well as new) State water quality standards will be promulgated as "Circular WQB-7".

February 25, 1994

Based on constituent concentrations being equal to, or exceeding an enforcement standard/GWPS, concentrations of tetrachloroethene detected in the ground water at several of the monitoring well locations and at least one private irrigation well adjacent to the City of Helena Class II Landfill have been determined by the Department to have triggered the Assessment Monitoring phase. The City of Helena will be required to begin a program of Assessment Monitoring at the closed Class II Landfill site which involves:

- * Re-sampling all of the ground water monitoring wells for constituents of Table II (ARM 16.14.706) within 90-calendar days for the receipt of the laboratory analytical results by the owner/operator or contracted consulting firm [see ARM 16.14.708(1)(a)(ii)], or
- * The owner/operator may demonstrate that a source other than a disposal unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground water quality [see ARM 16.14.708(1)(j)].

The laboratory analytical results were received by the owner/operator, or their contracted consultant (i.e., Hydrometrics) on January 12, 1994. Therefore, the Department will consider the 90-calendar day re-sampling, or demonstration period to expire on April 13, 1994.

SUBJECT 2: "Helena Landfill 1993 Annual Report on Ground Water Monitoring".

2.0 Ground Water Sampling

(Pg. 2) Sampling of the MPC monitoring wells (1 & 2) was not required by the Department until the Spring 1993 sampling event. Due to the limited quantity of sample available from the MPC-2 well for analysis from this sampling event, the analytical data results for MPC-2 should be considered to be inconclusive. The Department is unclear as to when and what results were referred to prior to the sampling event conducted for the Spring of 1993 mentioned above, which apparently included MPC-1. Please provide this additional analytical data to the Department for review and for their files. [Also, see comment under SUBJECT (3) (Pg.8), in this letter.]

(Pg. 5) In reference to the Sampling and Analysis Plan (SAP) used for ground water sampling at the City of Helena Class II (closed) landfill, this Plan will need to be revised to address current site-specific needs **prior to conducting the Spring 1994/Assessment Monitoring sampling event.**

3.1 Potentiometric Data and Flow Rates

(Pg. 7) It is important to note that from the additional water level information collected in October, 1993 in areas adjacent to the landfill, a north-northwest direction of ground water flow has been more firmly defined, as well as a north-northeast flow direction possibly related to

apparent mounding conditions associated with the discharge of the storm-drain channel outlet north of the landfill.

The Department is concerned that the water quality of **domestic well #84** located directly north of the storm discharge channel effluent area may be impacted. This well should be sampled for at least, ARM 16.14.706 Table I (plus dichlorodifluoromethane) volatile organic compounds (VOCs) and nitrates, as soon as possible. The extent of dilution from the storm-drain effluent northward could be better determined from this water quality analysis, as well as providing the necessary protection of human health and the environment.

The Department also strongly recommends, before irrigation wells I-1, I-2, I-3, and I-4 are used heavily for summer watering at Bill Roberts Golf Course and ball fields, samples be collected from these wells and analyzed for at a minimum, VOCs (according to ARM 16.14.706 Table 1, plus dichlorodifluoromethane).

(Pg. 9) The hydraulic gradient was given for this site as being 0.02 ft./ft. Variabilities in gradient were mentioned earlier (pg.7), but were not quantified. From what data was the 0.02 ft/ft hydraulic gradient determined? What is the hydraulic gradient on the northeast side of the ground water mound, and how might it affect the rate of migration in the ground water?

In relation to the seepage velocity range presented in the text of the annual report, it is also important to determine the character of the particular constituent of interest and the rates at which they might travel in ground water. This comment is in reference to the earlier analytical information that depicted the dichlorodifluoromethane plume traveling well in advance of the heavier constituents such as tetrachloroethene which we are presently observing to be migrating in significant concentrations beyond the relevant point of compliance (RPOCs) of the landfill. (See the comment in SUBJECT (4) Other, below).

3.2 Analytical Results

(Pg. 10) References throughout this section concerning "other sources" for contamination in the ground water were vague and undocumented. If you wish to continue to emphasize this issue, specific source and migration pathways will be required to be documented.

4.0 Conclusions and Recommendations

(Pg. 11) The suggestion, involving additional time for monitoring in order to help determine if "equilibrium conditions" exist, will no longer be acceptable according to ARM 16.14.708(4)(a). This regulation will require that a corrective measures plan be submitted to the Department within 60-calendar days from the receipt of the analytical results from the Table II Assessment Monitoring event [see ARM 16.14.708(4)(a)(iv)]. A positive remedial effort could help to

February 25, 1994

delineate the extent of the impact to the ground water that may be directly associated with leachate leakage/migration into the ground water from the landfill.

The Department is in agreement with the need for the installation of additional down gradient monitoring wells. Please consider the construction of these wells for possible remedial usage, as well.

Installation of an additional upgradient/background well or wells is also supported by the Department, especially considering the vast expansive area possibly associated with the landfill plume(s). Please note, Memorial Park appears to be cross gradient to the existing landfilled areas, and although a monitoring well may need to be located there for further delineation of the extent of the plume(s), it would probably not be a satisfactory location for an upgradient/background monitoring well location.

(Pg. 12) Tetrachloroethene is not considered by the Department to be a "common contaminant" found in the ground water in this area, other than it is "common" due to the characteristics of leachate possibly being generated at the base of the landfill and migrating into the ground water.

SUBJECT 3: "Evaluation of Ground Water Quality Data at the City of Helena, February, 1994."

Most of the comments expressed in SUBJECT (2) above, could be reiterated here in greater detail. Specific document related comments follow.

(Pgs. 3 & 8) With reference to upgradient "chemicals" in the ground water, chlorofluorocarbons have generally been detected down gradient in the ground water in the immediate vicinity of the landfill, as well as tetrachloroethene. Both constituents (found together) are usually indicative of the chemical characteristics of landfill leachate. Except for some historically low concentrations of 1,1,1-trichloroethane detected in the existing background monitoring well (83-6) in both the Spring and Fall 1992 sampling events; 1,1,1-trichloroethane has not been detected in either the Spring or Fall event in 1993.

(Pg. 8) Please provide the analytical data on the MPC 1 & 2 monitoring wells prior to the Spring 1993 ground water sampling event. This early analytical data has been depicted in Figures 5 through 7 which show "Temporal Trends" for certain parameters/constituents detected in the ground water. This data has undoubtedly been used to generate portions of the box plots presented in Figures 3 and 4 of the evaluation report.

2.3 Data Set Limitations (Pg. 8)

(General Comment) Because the MCL/GWPS has been equaled or exceeded in the ground water analysis for tetrachloroethene (MCL = 5 mg/L) at this site, statistical data interpretations/data interpretative errors are irrelevant at this point, but may be useful in the future.

(Pg. 26) Tetrachloroethene.

Concentrations of tetrachloroethene have been the highest in monitoring well EPA-1, not MPC-2 as stated in the evaluation report. EPA-1 is considered to be down gradient from the old landfill area and will be regulated as an RPOC monitoring point for the east property boundary. Please clarify what is meant in this section of the report.

(Pg. 28) Install Additional Background Wells.

The recommendation to install a background well within the Carroll College property may create a problem, if the same valley-fill/alluvial aquifer is not present. Bedrock underlies a major part of the area and the valley-fill/alluvium may not be sufficiently deposited over this area for adequate ground water sampling. What is the disposition of monitoring well 82-3 which according to the site map, is located on the northeast side of the Carroll College area? Could this well be used?

(Pg. 28) Begin Monitoring for Expanded List of Parameters.

The entire expanded list (i.e., ARM 16.14.706 Table II) of parameters/constituents is only required to be run on an annual basis [see ARM 16.14.708(1)(a)(v)(A)]. Quarterly sampling will include ARM 16.14.706 Table I, plus any additional parameters/constituents that were previously detected in the Table II analysis [see ARM 16.14.708(1)(a)(v)(B)].

OTHER (4): Article in the Independent Record on February 19, 1994.

This article discussed usage of irrigation wells within the City limits. Golf course irrigation wells were discussed as "grandfathered" or exempt from this new determination that private irrigation wells may no longer be used within the City limits. In an effort for the City to find additional sources for irrigation water at the golf course, Lewis and Clark County has determined that a well at the County Fairgrounds may be used as an additional water supply for irrigation of the golf course and ball fields, if piping for conveyance is economically feasible.

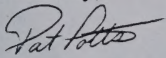
The Department is concerned over this proposed action, and the possible ramifications extensive pumping of the aquifer at the Fairgrounds' well location may have on the extent of the existing plume(s) in this immediate area. This concern is based more specifically on the concentrations of tetrachloroethene and dichlorodifluoromethane detected in the ground water at irrigation well #5 Colvin, domestic wells #52 Hartzel and #59 Stolp, all of which are located north of Custer Avenue and north-northwest of Benton Avenue. An increase in the ground water gradient in this area could be caused by higher pumping rates and/or extended water withdrawal due to possible aquifer

February 25, 1994

drawdown at the Fairgrounds' well that is proposed as an additional irrigation source for the golf course. It is possible that increased usage of the aquifer in the area of the Fairgrounds could expand the north-northwest (i.e., down gradient) extent of possible contaminate plume(s) detected in well numbers 5, 52, and 59, mentioned above. A study of the hydraulic effects in association with the ground water flow when influenced by increased pumpage in this area is strongly recommended before such a plan is considered.

The Department realizes that a lot of issues have been covered in this letter. With the inevitable onset of Assessment Monitoring being required at this facility within 90-calendar days, the Department strongly suggests that the City and their technical representatives (Hydrometrics) have a meeting to discuss the most appropriate and expedient plan of action concerning the Assessment Monitoring and possible Corrective Measures approaches to the problem. The Department suggests that a meeting agenda be submitted to the Department which outlines the pertinent issues of immediate concern. We will schedule the meeting here at our office at 836 Front Street. Please inform us of a date and time in the very near future which would be suitable to all parties for this meeting.

Sincerely,



Pat Potts
Environmental Specialist

cc: Steve Downs, Geological Engineer, Hydrometrics, Inc., 2727 Airport Road, Helena, MT 59601

Howard Reid, R.S., City-County Building, 316 North Park, P.O. Box 1723, Helena, MT 59624

Lewis & Clark County Commissioners, 316 North Park Avenue, Helena, MT 59623

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